

Serial No. 09/408,965

Docket No. 22-0056

REMARKS

Claims 61-115 are currently pending in the subject application, and are presently under consideration. Claims 1-9, 11, 14-35, 37, and 40-55 have been rejected. Claims 10, 12, 13, 36, 38, and 39 have been indicated as allowable. Claims 1-60 have been cancelled. Claims 61-115 have been added. Claims 61-69, 71, 74-95, 97, and 100-115 correspond to rejected claims 1-9, 11, 14-35, 37, and 40-55, respectively, and claims 70, 72, 73, 96, 98, and 99 correspond to allowable claims 10, 12, 13, 36, 38, and 39, respectively. Favorable reconsideration of the application is requested in view of the amendments and comments herein.

I. Rejection of Claims 53-55 Under 35 U.S.C. §103(a)

Claims 53-55 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Pat. No. 5,659,545 to Sowles et al. ("Sowles") in view of U.S. Pat. No. 5,802,044 to Baum et al. ("Baum"). Withdrawal of this rejection and allowance of claims 113-115 is respectfully requested for at least the following reasons.

New claim 113 (cancelled rejected claim 53) recites a method of synchronizing an earth terminal in a satellite communication network comprising transmission of synchronization bursts from an earth terminal to a satellite in accordance with a downlink symbol counter. New claim 113 also recites a code reported to the earth terminal representing whether the synchronization burst received at the satellite is one of early, late, absent and on time. New claim 114 (cancelled rejected claim 54) recites a system for synchronizing an earth terminal with a satellite in a communication network comprising an earth terminal transmitting a synchronization burst in accordance with a downlink symbol counter, and said satellite reporting to said earth terminal, a code representing whether said synchronization burst received at said satellite is one of early, late, absent and on time.

Sowles discloses a subscriber unit that adjusts its time for a propagation delay over a range from 2.3 to 11 milliseconds. The Office Action further relies on Sowles to reject claim 53, arguing that this time adjustment delay range of 2.3 to 11 milliseconds proves an inherent timer

Serial No. 09/408,965

Docket No. 22-0056

means, and thus a downlink symbol counter. A symbol counter is not similar to a timer residing at an earth station. Furthermore, Sowles specifically teaches that the transmit time is adjusted based on information received in task 113 (col. 11, ll. 33-34) (*i.e.*, timing and offset and frequency offset information in downlink sync message (col. 11, ll. 13-16)) based on synchronization bursts sent in task 112. Therefore, Sowles simply employs timing error information to adjust synchronization bursts, while synchronization, as recited in claims 113 and 114, is performed by transmitting synchronization bursts in accordance with a downlink symbol counter, which is based on a number of symbols received by the earth station from the satellite. This adjusting of synchronization burst based on downlink symbol count is not taught or suggested by Sowles.

Baum discloses a reverse link symbol timing synchronization method where the subscriber unit will receive a round trip delay value that is positive or negative to reflect whether the transmitted burst was early or late. The system recited in Baum, however, does not teach or suggest a communication system for satellite to ground terminal communications that employs a symbol counter for synchronization of signal communications, as recited in claim 113 and 114. Therefore, neither Sowles nor Baum, alone or in combination, teach or suggest the elements recited in claims 113 and 114.

Claim 115 depends from claim 113 and recites an adjustment of the downlink symbol counter to account for timing errors in the synchronization burst between the satellite and the ground terminal. Neither Sowles nor Baum teach or suggest adjusting a downlink symbol counter to account for timing errors in a synchronization burst. Furthermore, neither Sowles nor Baum recite the use of a symbol counter for synchronization of signal communications with respect to claim 113 from which claim 115 depends. Therefore, neither Sowles nor Baum, alone in combination, teach or suggest the elements recited in claim 115.

For the reasons described above, claims 113-115 should be patentable over the cited art. Accordingly, withdrawal of this rejection is respectfully requested.

Serial No. 09/408,965

Docket No. 22-0056

II. Rejection of Claims 1, 2, 18-28, and 44-52 Under 35 U.S.C. §103(a)

Claims 1, 2, 18-28, and 44-52 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Sowles in view of Baum and further in view of U.S. Pat. No. 4,577,316 to Schiff ("Schiff"). Withdrawal of this rejection and allowance of claims 61, 62, 78-88, and 104-112 is respectfully requested for at least the following reasons.

New claim 61 (cancelled rejected claim 1) recites a method of synchronizing an earth terminal in a satellite communication network comprising maintenance of a downlink symbol counter clocked at a downlink clock rate, determination of a downlink symbol count representative of a time of arrival at a satellite of a burst transmitted from an earth terminal, adjustment of said downlink symbol counter to correspond to said downlink symbol count. New claim 61 also recites that the method of synchronizing an earth terminal in a satellite communication network comprises transmission of synchronization bursts from said earth terminal to said satellite in accordance with said downlink symbol counter, determination at said satellite whether said synchronization bursts received at said satellite are one of early, late, absent, and on time; and reporting in a downlink signal to said earth terminal a code representing whether said synchronization burst received at said satellite is one of early, late, absent and on time.

Sowles discloses the measurement of timing and frequency offsets to discover if there is propagation delay in communications between a satellite and subscriber unit. Baum discloses a reverse link symbol timing synchronization method where the subscriber unit will receive a round trip delay value that is positive or negative to reflect whether the transmitted burst was early or late. Neither Sowles nor Baum teach or suggest employing a downlink symbol count that is representative of a time of arrival at a satellite of a synchronization burst and adjusting a downlink symbol counter to correspond to the downlink symbol count to synchronize an earth terminal in a satellite communication network, as recited in independent claim 61.

Schiff does not cure the aforementioned deficiencies with respect to Sowles and Baum. Schiff discloses a transmitter timing register incremented by the number of clock pulses of transmission delay. The Office Action rejection fails to appreciate that the transmitter timing

Serial No. 09/408,965

Docket No. 22-0056

register is not the same as the downlink symbol counter as recited in claim 61. The timing register of Schiff increments with each clock pulse during a transmission, with a certain amount of data being transmitted between each clock pulse. The downlink symbol counter as recited in claim 61, however, is adjusted based on a symbol count received at the earth terminal, thus resulting in a finer measured resolution and hence a more accurate representation of transmission time. Therefore, neither Sowles, Baum nor Schiff, alone or in combination teach or suggest the elements recited in claim 61. Therefore, claim 61 should be allowable over the cited art. Claims 62 and 78-86 depend directly or indirectly from claim 61 and therefore contain each and every element recited in claim 61. Therefore, for the reasons set forth above, claims 61, 62 and 78-86 should be patentable over the cited art, and withdrawal of the rejection with respect to claims 61, 62 and 78-86 is respectfully requested

New claim 87 (cancelled rejected claim 27) recites a synchronization method for a satellite communication network comprising the establishment of a communication satellite in orbit, the establishment of an earth terminal in communication with said satellite, generation of a master clock on said satellite, transmission of downlink symbols synchronously with said master clock from said satellite to said earth terminal, maintenance of said earth terminal a downlink symbol counter clocked at a downlink clock rate, determination of a downlink symbol count representative of a time of arrival of a burst transmitted from an earth terminal to a satellite, adjustment of said downlink symbol counter to correspond to said downlink symbol count upon receipt of a predetermined reference point in a downlink frame, and transmitting synchronization bursts from said earth terminal to said satellite in accordance with said downlink symbol counter.

Neither Sowles nor Baum teach or suggest employing a downlink symbol count that is representative of a time of arrival at a satellite of a synchronization burst and adjusting a downlink symbol counter to correspond to the downlink symbol count upon receipt of a predetermined reference point in a downlink, as recited in independent claim 61.

Schiff does not cure the aforementioned deficiencies with respect to Sowles and Baum. Schiff discloses a transmitter timing register incremented by the number of clock pulses of transmission delay. The timing register of Schiff increments with each clock pulse during a

Serial No. 09/408,965

Docket No. 22-0056

transmission, with a certain amount of data being transmitted between each clock pulse. The timing register in Schiff is therefore counting clock pulses, and not symbols sent across the transmission. Therefore, Schiff does not teach or suggest that which is being recited in claim 87. Thus, for at least these reasons, claim 87, as well as claims 88 and 104-112 which depend therefrom, should be allowed and withdrawal of the rejection with respect to claims 87, 88 and 104-112 is respectfully requested.

For the reasons described above, claims 61, 62, 78-88, and 104-112 should be patentable over the cited art. Accordingly, withdrawal of this rejection is respectfully requested.

III. Rejection of Claims 3-9, 11, 14-17, 26, 29-35, 37, 40-43, and 52 Under 35 U.S.C. §103(a)

Claims 3-9, 11, 14-17, 26, 29-35, 37, 40-43, and 52 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Sowles in view of Baum, Schiff, and U.S. Pat. No. 5,867,489 to Hershey et al. ("Hershey"). Withdrawal of this rejection and allowance of claims 63-69, 71, 74-77, 86, 89-95, 97, 100-103, and 112 is respectfully requested for at least the following reasons.

Hershey recites a way to determine the distance between the ground stations and satellites and providing the position of the satellite to the earth terminal. It also recites a way for ground stations to derive information about a spacecraft from despreading a ranging signal from a master ground station. However, Hershey does not teach or suggest a downlink symbol counter based on a number of symbols received by the earth station from the satellite, as recited in independent claims 61 and 67. Claims 63-69, 71, 74-77 and 86 depend directly or indirectly from claim 61, and claims 89-95, 100-103 depend directly or indirectly from claim 87. Hershey does not make up for the aforementioned deficiencies of Sowles, Baum and Schiff with respect to independent claims 61 and 87. Therefore, for at least this reason, claims 63-69, 71, 74-77, 86, 89-95, 97, 100-103, and 112 are not obvious in light of the cited art. Accordingly, withdrawal of this rejection is respectfully requested.

Serial No. 09/408,965

Docket No. 22-0056

CONCLUSION

In view of the foregoing remarks, Applicant respectfully submits that the present application is in condition for allowance. Applicant respectfully requests reconsideration of this application and that the application be passed to issue.

Please charge any deficiency or credit any overpayment in the fees for this amendment to our Deposit Account No. 20-0090.

Respectfully submitted,

Date 7/7/04

Christopher P. Harris
Christopher P. Harris
Registration No. 43,660

CUSTOMER No.: 26294

TAROLLI, SUNDHEIM, COVELL, & TUMMINO L.L.P.
526 SUPERIOR AVENUE, SUITE 1111
CLEVELAND, OHIO 44114-1400
Phone: (216) 621-2234
Fax: (216) 621-4072